



**Texas State Soil and Water Conservation Board  
 Clean Water Act §319(h) Nonpoint Source Grant Program  
 FY 2010 Project Workplan 10-07**

**SUMMARY PAGE**

Title of Project	Surface Water Quality Monitoring and Additional Data Collection Activities to Support the Implementation of the Plum Creek Watershed Protection Plan					
Project Goals	<ul style="list-style-type: none"> <li>• Generate data of known and acceptable quality for surface and ground water quality monitoring of main stem and tributary stations</li> <li>• Support the implementation of the Plum Creek WPP by collecting water quality data for use in evaluating the effectiveness of BMPs, and in assessing water quality improvement and progress in achieving restoration</li> <li>• Communicate water quality conditions to the public and the Plum Creek Watershed Partnership Steering Committee in order to support adaptive management of the Plum Creek WPP and to expand public knowledge on Plum Creek water quality data</li> <li>• Conduct a gain/loss study to better define the relationship between surface flows and groundwater recharge in the Plum Creek watershed through two synoptic condition surveys</li> </ul>					
Project Tasks	1) Project Administration and Coordination; 2) Quality Assurance; 3) Routine Ambient Surface Water Quality Monitoring; 4) Targeted Watershed Surface Water Quality Monitoring; 5) Storm Event Water Quality Monitoring; 6) 24-hour DO Surface Water Quality Monitoring; 7) Effluent Surface Water Quality Monitoring; 8) Springflow Surface Water Quality Monitoring; 9) Leona Aquifer Groundwater Quality Monitoring; 10) Gain/Loss Study; 11) Water Quality Kiosks; 12) Data Management					
Measures of Success	<ul style="list-style-type: none"> <li>• Data of known and acceptable quality are generated for surface water quality monitoring of main stem and tributary stations</li> <li>• Data of known and acceptable quality are generated for ground water quality monitoring of shallow wells from the Leona Aquifer</li> <li>• Water quality data is used to evaluate progress in implementing the Plum Creek WPP and achieving water quality restoration</li> <li>• Water quality data is communicated to the public and the PCWP Steering Committee</li> <li>• Increased watershed stewardship among Plum Creek watershed stakeholders</li> </ul>					
Project Type	Implementation ( ); Education (X); Planning ( ); Assessment (X); Groundwater (X)					
Status of Waterbody on 2008 Texas Water Quality Inventory and 303(d) List	<u>Segment ID</u> 1810	<u>Parameter</u> Bacteria Ammonia; nitrate+nitrite nitrogen; total phosphorus	<u>Category</u> 5c CN			
Project Location (Statewide or Watershed and County)	Plum Creek Watershed in Caldwell, Hays and Travis Counties					
Key Project Activities	Hire Staff (X); Surface Water Quality Monitoring (X); Technical Assistance ( ); Education (X); Implementation ( ); BMP Effectiveness Monitoring (X); Demonstration ( ); Planning ( ); Modeling ( ); Bacterial Source Tracking ( ); Other (X)					
Texas NPS Management Program Elements	<ul style="list-style-type: none"> <li>• E1, LTG A, C, F; STG 1B, 1C, 1E, 2D, 3D</li> <li>• E2, E5</li> </ul>					
Project Costs	Federal	\$485,545	Non-Federal	\$257,165	Total	\$742,710
Project Management	Guadalupe-Blanco River Authority					
Project Period	November 1, 2010 – March 31, 2015					

**Part I – Applicant Information**

Applicant							
Project Lead	Debbie Magin						
Title	Director of Water Quality Services						
Organization	Guadalupe-Blanco River Authority						
E-mail Address	dmagin@gbra.org						
Street Address	933 E Court St						
City	Seguin	County	Guadalupe	State	TX	Zip Code	78155
Telephone Number	(830) 379-5822			Fax Number	(830) 372-2757		

Project Partners	
Names	Roles & Responsibilities
Texas State Soil and Water Conservation Board (TSSWCB)	Provide state oversight and management of all project activities and ensure coordination of activities with related projects and TCEQ
Guadalupe-Blanco River Authority (GBRA)	Perform all work described in tasks. Provide non-federal match through Clean Rivers Program funds
Texas AgriLife Extension Service, Department of Soil and Crop Sciences (AgriLife Extension) [McFarland]	Continue facilitation of stakeholder process through TSSWCB project 08-07
Public Libraries – Cities of Kyle, Lockhart and Luling	Supervise and provide space, electricity and internet service for kiosks
U.S. Geological Survey (USGS)	Perform gain/loss survey and produce technical report

## Part II – Project Information

Project Type							
Surface Water	X	Groundwater	X				
Does the project implement recommendations made in a completed WPP or an adopted TMDL or approved I-Plan?				Yes	X	No	
If yes, identify the document.		Plum Creek Watershed Protection Plan					
If yes, identify the agency/group that developed and/or approved the document.		Plum Creek Watershed Partnership facilitated by AgriLife Extension and TSSWCB		Year Developed	2008		

Watershed Information				
Watershed Name(s)	Hydrologic Unit Code (8 Digit)	Segment ID	305(b) Category	Size (Acres)
Plum Creek Watershed	12100203	1810	5c	248,949

Water Quality Impairment
Describe all known causes (pollutants of concern) of water quality impairments or concerns from any of the following sources: <i>2008 Texas Water Quality Inventory and 303(d) List</i> , Clean Rivers Program Basin Summary/Highlights Reports or other documented sources.
<ul style="list-style-type: none"> <li>• <i>2007 GBRA CRP Basin Highlights Report</i> –Nutrient enrichment is a concern, likely due to high numbers of WWTFs contributing effluent. The southern part of the watershed has a history of oil and gas activities, leading to concerns for dissolved salts that can be contributed by improperly plugged oil and gas wells. The segment is in an area being developed very rapidly. Concerns are the cumulative impacts on watersheds caused by construction and multiple subdivision development. Also the potential for impacts by agricultural NPS pollution exists.</li> <li>• <i>2008 GBRA CRP Basin Summary Report</i> – Plum Creek site 17406 shows trends of diminishing water quality because the stream is effluent dominated. Total phosphorus shows an upward trend over time, exceeding the screening level 42% of the time. Nitrate nitrogen shows an increasing trend over time, exceeding the screening concentration 50% of the time. The water quality of the middle portion of the segment is represented by the data collected at CR 202 (site no. 12657). The majority of the total phosphorus was in the dissolved form, pointing to wastewater effluent or fertilizer, rather than phosphorus associated with algal cells or suspended sediment. Sources of dissolved and total phosphorus include wastewater effluent, storm water that carries in fertilizers and organic material and failing septic tanks. The median flow (12 cfs) in the lower portion of the creek is three times the flow in the middle Plum Creek, due to the contribution of flow from the West Fork and Clear Fork tributaries that confluence with the Plum Creek in the lower portion of the watershed. The median concentration for nitrate nitrogen exceeded the screening concentration 42% of the time. The bacterial concentrations rose with storm flows.</li> <li>• <i>2008 TWQI</i> – contact recreation use impairment, nutrient screening levels concern; NPS and point source</li> <li>• <i>2009 GBRA CRP Basin Highlights Report</i> – Nitrate-nitrogen and total phosphorus concentrations at these stations are some of the highest in the river basin. Both point and nonpoint sources contribute to the bacteria impairment. Based on land use analysis, sources of the pollutants include urban sources, such as urban runoff and pet waste, as well as agricultural activities and wildlife (deer) and invasive species (feral hogs) sources.</li> </ul>

## Project Narrative

### Problem/Need Statement

Plum Creek rises in Hays County north of Kyle and runs south through Caldwell County, passing Lockhart and Luling, and eventually joins the San Marcos River at their confluence north of Gonzales County. Plum Creek is 52 miles in length and has a drainage area of 389 mi<sup>2</sup>. According to the *2008 Texas Water Quality Inventory and 303(d) List*, Plum Creek (Segment 1810) is impaired by elevated bacteria concentrations (category 5c) and exhibits nutrient enrichment concerns for ammonia, nitrate+nitrite nitrogen and total phosphorus.

TSSWCB and AgriLife Extension established the Plum Creek Watershed Partnership (PCWP) in April 2006. The PCWP Steering Committee completed the “Plum Creek Watershed Protection Plan” in February 2008. Information about the PCWP is available at <http://plumcreek.tamu.edu/>. Sources of pollutants identified in the Plum Creek WPP include urban storm water runoff, pet waste, failing or inadequate on-site sewage facilities (septic systems), wastewater treatment facilities, livestock, wildlife, invasive species (feral hogs), and oil and gas production.

Originally, the Plum Creek WPP was to be developed using only existing water quality data. However, discussions with stakeholders identified data gaps which would make source identification and establishment of water quality goals difficult. Accurate source identification is key to prioritizing implementation projects for funding. Through TSSWCB project 03-19, *Surface Water Quality Monitoring to Support Plum Creek Watershed Protection Plan Development* GBRA collected water quality data to fill the identified data gaps. During the project, sampling of water quality data was severely hampered by a prolonged drought that covered the watershed, causing the tributaries to run dry and the springs to slow to almost negligible flow.

Facilitated by AgriLife Extension, implementation of the Plum Creek WPP is currently underway. TSSWCB project 08-07 *Implementing Agricultural Nonpoint Source Components of the Plum Creek WPP* provides technical and financial assistance through the local SWCDs to agricultural producers in developing and implementing water quality management plans (WQMPs). In order to reduce feral hog impacts on the stream, education and technical assistance is being provided, through project 08-07, by AgriLife Extension to landowners in the watershed on strategies to reduce and manage feral hog populations. The cities of Kyle and Lockhart have received TCEQ CWA §319(h) funding to retrofit detention facilities to improve water quality, educate and stencil storm sewer inlets, map existing storm water facilities, implement a dog waste collection station program, and coordinate city “housekeeping” activities designed to improve water quality (street sweeping, creek cleanup days, etc). Additionally, Lockhart will evaluate their existing storm water system, identify and prioritize upgrades to the city’s storm water management system including cleaning out and installing storm drain filters, and coordinate creek cleanup days, and household hazardous and electronic waste collection days. Any stream monitoring funded in the TCEQ project will be at sites associated with retrofitted or newly installed storm water BMPs. Storm water monitoring in this project will focus on areas not included in the TCEQ projects. An education and outreach campaign was initiated during the watershed planning process that focused on educating watershed residents and landowners on the impacts of specific land use activities, illegal dumping, proper operation and maintenance of OSSFs and proper disposal of pet waste.

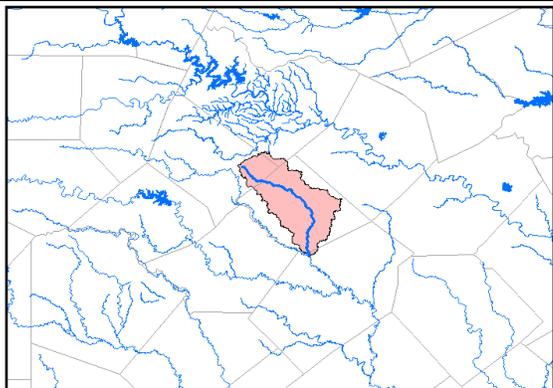
To demonstrate improvements in water quality, the Plum Creek WPP describes a water quality monitoring program designed to evaluate the effectiveness of BMPs implemented across the watershed and their impacts on instream water quality. Water quality data will be used in the adaptive management of the WPP in order to evaluate progress in implementing the Plum Creek WPP and achieving water quality restoration.

To avoid a data collection gap between the closing of TSSWCB project 03-19 and the initiation of this project, TSSWCB utilized state general revenue funds for project 10-54 “Surface Water Quality Monitoring to Support the Implementation of the Plum Creek WPP” to continue mainstem and some tributary snapshot surface water quality monitoring.

There is a need to continue the monitoring regime originally funded through TSSWCB project 03-19 and to implement the monitoring program described in the Plum Creek WPP which has begun, short-term, through TSSWCB project 10-54.

## Project Narrative

### General Project Description (Include Project Location Map)



Through this project, GBRA will continue to collect surface water quality monitoring (SWQM) data to characterize the Plum Creek watershed, including the contributing wastewater effluents. Monitoring data will be used to assess and evaluate the effectiveness of the BMPs that have been or will be implemented in the watershed as a result of the Plum Creek WPP. The sampling regime will include diurnal, springflow, storm event and targeted monitoring under more typical base flow conditions over the next four years. This will provide a more complete and representative data set to characterize the Plum Creek watershed and document water quality improvements.

GBRA will conduct the majority of the work performed under this project including technical and financial supervision, preparation of status reports, coordination with local stakeholders, surface water quality monitoring sample collection and analysis, and data management. GBRA will participate in the PCWP, Steering Committee, and Technical Advisory Group (TAG) in order to communicate project goals, activities and accomplishments to affected parties. GBRA will continue to host and maintain an Internet webpage <http://www.gbra.org/plumcreek/> for the dissemination of information.

GBRA will develop a Quality Assurance Project Plan (QAPP) for monitoring activities to ensure data of known and acceptable quality are generated in this project. The QAPP will be consistent with *EPA Requirements for Quality Assurance Project Plans (QA/R-5)*, the *TSSWCB Environmental Data Quality Management Plan*, and various TCEQ guidelines for monitoring procedures and methods. In year two of the project, the QAPP will be amended to include the identification of the groundwater monitoring wells as well as the meta data that will be collected at each well site. GBRA will submit monitoring data to TSSWCB for inclusion in the TCEQ Surface Water Quality Monitoring Information System (SWQMIS).

Currently, routine ambient water quality data is collected monthly at 3 main stem stations by GBRA (17406, 12640 and 12647) through the Clean Rivers Program. Through this project, GBRA will conduct routine ambient monitoring at an additional 5 sites monthly over 51 months, collecting field, conventional, flow and bacteria parameter groups. This will complement existing routine ambient monitoring regime conducted by GBRA such that routine water quality monitoring is conducted monthly at 8 sites in the Plum Creek watershed.

GBRA will conduct targeted watershed monitoring at 35 sites twice per season, once under dry weather conditions and once under wet weather conditions, collecting field, conventional, flow and bacteria parameter groups. Sampling period extends through 17 seasons. Spatial, seasonal and meteorological variation will be captured in these snapshots of watershed water quality.

GBRA will conduct automated storm event monitoring up to 3 urban/residential sites during 4 storm events each year (once per quarter) for 15 months, collecting field, conventional, flow and bacteria parameter groups. Depending on meteorological conditions, seasonal variation in storm events will be captured.

GBRA will conduct 24-hour DO monitoring at 7 sites monthly during the index period collecting field and flow parameter groups. These sites shall be the same as the sites for routine ambient monitoring, except for the site at CR202 because GBRA currently maintains a continuous water quality monitoring module that collects the flow and field parameters every fifteen minutes. Sampling period extends over 8 months during the index period of each year of the project, except for the final year, in which the diurnal sampling will end at the end of the contract period.

GBRA will conduct effluent monitoring at seven wastewater treatment facilities (WWTFs) once per month collecting field, conventional, flow, bacteria and effluent parameter groups. The sampling period will extend over 51 months. This

will characterize WWTF contributions to flow regime and pollutant loadings. To supplement the data collected at the WWTFs, GBRA will compile all the weekly permit effluent monitoring data as submitted by permittees that includes BOD, total suspended solids, volatile suspended solids, *E. coli*, ammonia nitrogen and total phosphorus from seven WWTFs.

GBRA will conduct springflow monitoring at 3 springs once per season collecting field, conventional, flow and bacteria parameter groups. The sampling period will extend over 17 seasons. Spatial and seasonal variation in springflow will be captured. This will characterize spring contributions to flow regime and pollutant loadings.

In year 4, up to 30 wells will be inventoried in order to provide water quality and meta data (water depth, installation method, date of installation, cased, sealed or open, use of water, land use in immediate area and proximity to Plum Creek or tributary) from shallow wells that are in the Leona formation within the Plum Creek watershed, to determine if there is recharge of the Leona by the effluent-dominated Plum Creek or impacts of septic tanks to the shallow groundwater.

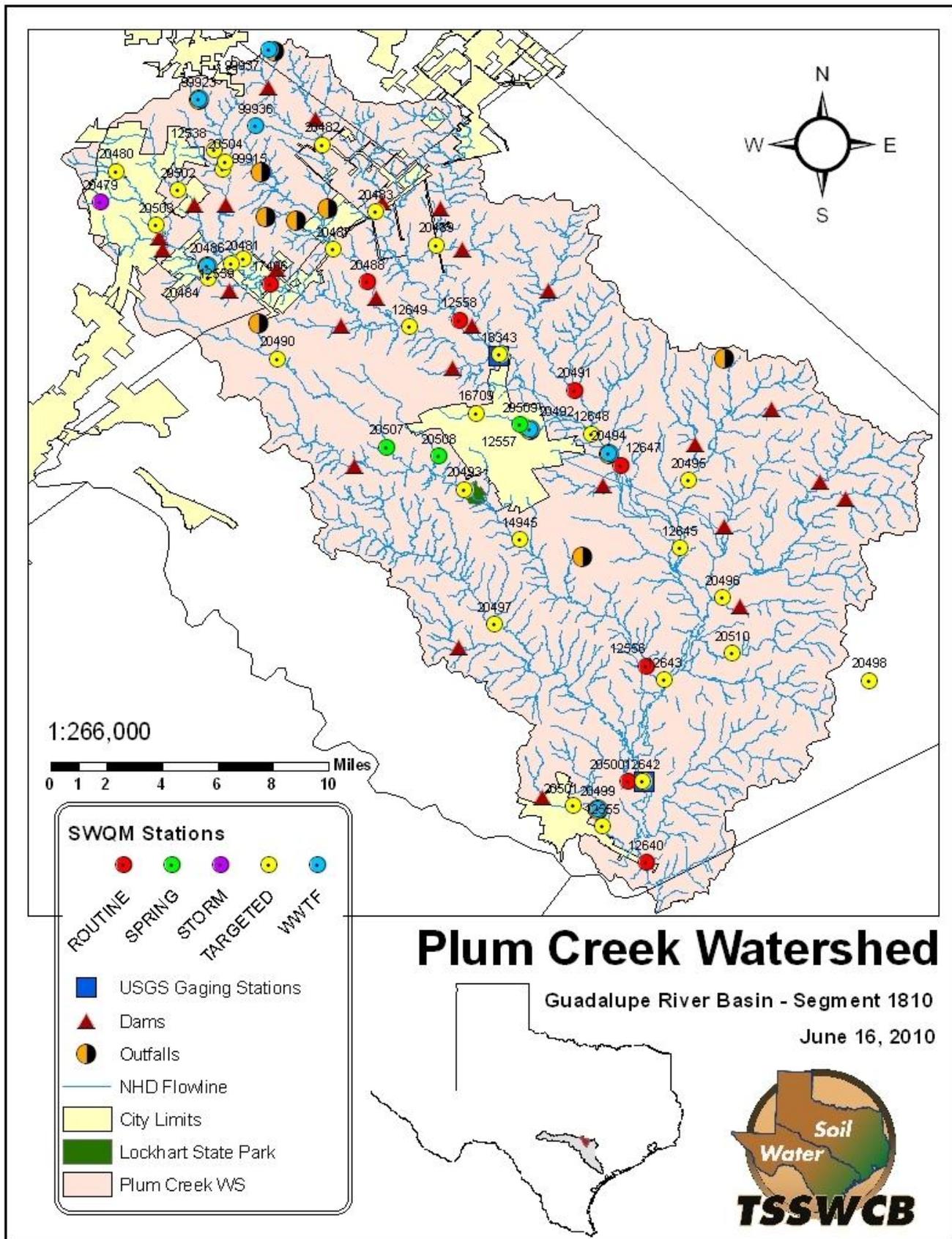
When the load duration curves for the WPP were being developed there was an observed loss of flow between mid and lower index sites. As a result of this, the need for a gain/loss study was identified to better define the relationship between surface flows and groundwater recharge in the Plum Creek watershed. USGS will conduct a gain/loss study on the Plum Creek watershed, based on five locations within the watershed. The study will include two synoptic condition surveys. USGS will provide a written report of their findings.

GBRA maintains a real-time water quality monitoring station at the Plum Creek at CR 202 site and collects field and flow data every 15 minutes. In order to continue to raise awareness of water quality and stewardship in the Plum Creek watershed and make water quality data available to the public, GBRA will install three kiosks in public locations in Kyle, Lockhart and Luling. These kiosks will link the public to the real-time monitoring site, the project web site, other pertinent water quality information, such as the GBRA *River of Life* and on-line training modules including the module on septic system operations (developed through TCEQ CWA §106 funds), will be available at three public libraries in the cities in the watershed.

GBRA will post monitoring data to the GBRA website in a timely manner. GBRA will summarize the results and activities of this project through inclusion in GBRA's Clean Rivers Program Basin Highlights Report and/or Basin Summary Report. Additionally, the results and activities of this project will be summarized in quarterly reports to the stakeholders of the PCWP Steering Committee and in revisions to the Plum Creek WPP. GBRA will develop a final Assessment Data Report summarizing water quality data collected through Tasks 3-8. The Report shall, at a minimum, provide an assessment of water quality with respect to effectiveness of BMPs implemented and a discussion of interim short-term progress in achieving the Plum Creek WPP water quality goals.

TCEQ Station ID	Site Description	Workplan Task	Monitor Type	DO 24hr	Bacteria	Conventional	Flow	Field
12556	Clear Fork Plum Creek at Salt Flat Road	3	RT		51	51	51	51
12556	Clear Fork Plum Creek at Salt Flat Road	6	BS	33			33	33
12556	Clear Fork Plum Creek at Salt Flat Road	4	BF		17	17	17	17
12558	Elm Creek at CR 233	3	RT		51	51	51	51
12558	Elm Creek at CR 233	6	BS	33			33	33
12558	Elm Creek at CR 233	4	BF		17	17	17	17
12640	Plum Creek at CR 135	3	RT		51	51	51	51
12640	Plum Creek at CR 135	6	BS	33			33	33
12640	Plum Creek at CR 135	4	BF		17	17	17	17
12647	Plum Creek at Old McMahan Road (CR 202)	3	RT		51	51	51	51
12647	Plum Creek at Old McMahan Road (CR 202)	6	BS	33			33	33
12647	Plum Creek at Old McMahan Road (CR 202)	4	BF		17	17	17	17
12647	Plum Creek at Old McMahan Road (CR 202)	5	BF		8	8	8	8
17406	Plum Creek at Plum Creek Road	3	RT		51	51	51	51
17406	Plum Creek at Plum Creek Road	6	BS	33			33	33
17406	Plum Creek at Plum Creek Road	4	BF		17	17	17	17
20488	Brushy Creek at Rocky Road (Upstream of NRCS 14)	3	RT		51	51	51	51
20488	Brushy Creek at Rocky Road (Upstream of NRCS 14)	6	BS	33			33	33
20488	Brushy Creek at Rocky Road (Upstream of NRCS 14)	4	BF		17	17	17	17
20491	Dry Creek at FM 672	3	RT		51	51	51	51
20491	Dry Creek at FM 672	6	BS	33			33	33
20491	Dry Creek at FM 672	4	BF		17	17	17	17
20500	West Fork Plum Creek at Biggs Road (CR 131)	3	RT		51	51	51	51
20500	West Fork Plum Creek at Biggs Road (CR 131)	6	BS	33			33	33
20500	West Fork Plum Creek at Biggs Road (CR 131)	4	BF		17	17	17	17
12555	Salt Branch at FM 1322	4	BF		32	32	32	32
12555	Salt Branch at FM 1322	5	BF		8	8	8	8
12557	Town Creek at E. Market St. (Upstream of Lockhart #1 WWTP)	4	BF		32	32	32	32
12559	Porter Creek at Dairy Road	4	BF		32	32	32	32
12642	Plum Creek at Biggs Road (CR 131)	4	BF		32	32	32	32
12643	Plum Creek at FM 1322	4	BF		32	32	32	32
12645	Plum Creek at Young Lane (CR 197)	4	BF		32	32	32	32
12648	Plum Creek at CR 186	4	BF		32	32	32	32
12649	Plum Creek at CR 233	4	BF		32	32	32	32
14945	Clear Fork Plum Creek at Old Luling Road (CR 213)	4	BF		32	32	32	32
16709	Town Creek West of Lockhart	4	BF		32	32	32	32
18343	Plum Creek Upstream of US 183	4	BF		32	32	32	32
20480	Plum Creek Downstream of NRCS 1 Spillway	4	BF		32	32	32	32
20481	Bunton Branch at Heidenreich Lane	4	BF		32	32	32	32
20482	Brushy Creek at FM 2001 (Downstream of NRCS 12)	4	BF		32	32	32	32
20487	Brushy Creek at SH 21	4	BF		32	32	32	32
20483	Elm Creek at SH 21 (Downstream of NRCS 16)	4	BF		32	32	32	32
20489	Cowpen Creek at Schuelke Road	4	BF		32	32	32	32
20496	Tenney Creek at Tenney Creek Road	4	BF		32	32	32	32
20490	Clear Fork Plum Creek at Farmers Road	4	BF		32	32	32	32
20493	Clear Fork Plum Creek at PR 10 (State Park)	4	BF		32	32	32	32
20497	West Fork Plum Creek at FM 671	4	BF		32	32	32	32
12538	Andrews Branch at CR 131	4	BF		32	32	32	32
20495	Dry Creek at FM 713	4	BF		32	32	32	32
20484	Plum Creek at Heidenreich Lane (Downstream of Kyle WWTP)	4	BF		32	32	32	32
20484	Plum Creek at Heidenreich Lane (Downstream of Kyle WWTP)	5	BF		8	8	8	8
20501	Salt Branch at Salt Flat Road (Upstream of Luling WWTP)	4	BF		32	32	32	32
20498	Copperas Creek at Tenney Creek Road/Bronco Lane (CR 141, Downstream of Cal-Maine)	4	BF		32	32	32	32
20505	Richmond Branch at Dacy Lane	4	BF		32	32	32	32
20504	Porter Creek Tributary at Quail Cove Road	4	BF		32	32	32	32

TCEQ Station ID	Site Description	Workplan Task	Monitor Type	DO 24hr	Bacteria	Conventional	Flow	Field
20510	Hines Branch at Tenney Creek Road (CR 141, Downstream of Cal-Maine)	4	BF		32	32	32	32
20503	Plum Creek at Lehman Road	4	BF		32	32	32	32
20502	Bunton Branch at Dacy Lane (upstream of NRCS 5)	4	BF		32	32	32	32
20479	Unnamed Tributary at FM 150 near Hawthorn Dr.	4	BF		32	32	32	32
20492	10210-001 City of Lockhart and GBRA #1 (Larremore plant)	7	-		51	51	51	51
20494	10210-002 City of Lockhart and GBRA #2 (FM 20 plant)	7	-		51	51	51	51
20499	10582-001 City of Luling	7	-		51	51	51	51
20486	11041-002 City of Kyle and Aquasource Inc.	7	-		51	51	51	51
99923	11060-001 City of Buda and GBRA	7	-		51	51	51	51
99936	14431-001 GBRA Shadow Creek	7	-		51	51	51	51
99937	14377-001 GBRA Sunfield	7	-		51	51	51	51
20509	Lockhart Springs	8	BS		17	17	17	17
20507	Clear Fork Springs at Borchert Loop (CR 108)	8	BS		17	17	17	17
20508	Boggy Creek Springs at Boggy Creek Road (CR 218)	8	BS		17	17	17	17



Tasks, Objectives and Schedules						
Task 1	Project Administration and Coordination					
Costs	Federal	\$0	Non-Federal	\$73,246	Total	\$73,246
Objective	To effectively administer, coordinate and monitor all work performed under this project including technical and financial supervision and preparation of status reports.					
Subtask 1.1	The GBRA will prepare electronic quarterly progress reports (QPRs) for submission to the TSSWCB. QPRs shall document all activities performed within a quarter and shall be submitted by the 15 <sup>th</sup> of January, April, July and October. QPRs shall be distributed to all project partners and posted on project website.					
	Start Date	Month 1	Completion Date	Month 53		
Subtask 1.2	The GBRA will perform accounting functions for project funds and will submit appropriate Reimbursement Forms to TSSWCB at least quarterly.					
	Start Date	Month 1	Completion Date	Month 53		
Subtask 1.3	GBRA will participate in coordination meetings or conference calls with the TSSWCB, hosted by AgriLife Extension through TSSWCB project 08-07, at least quarterly to discuss project activities, project schedule, communication needs, deliverables, and other requirements. GBRA will develop lists of action items needed following each project coordination meeting and distribute to project personnel.					
	Start Date	Month 1	Completion Date	Month 53		
Subtask 1.4	GBRA will attend and participate in the PCWP, Steering Committee, and TAG meetings and other meetings as appropriate in order to communicate project goals, activities and achievements accomplishments to affected parties.					
	Start Date	Month 1	Completion Date	Month 53		
Subtask 1.5	GBRA will develop and disseminate project informational materials, including, but not limited to, flyers, brochures, letters, news releases, and other appropriate promotional publications. As appropriate, GBRA will include information about the project, in the <i>GBRA River Run</i> and other publications. TSSWCB must approve all announcements, letters and publications prior to distribution.					
	Start Date	Month 1	Completion Date	Month 53		
Subtask 1.6	GBRA will continue to host and maintain an Internet webpage <a href="http://www.gbra.org/plumcreek/">http://www.gbra.org/plumcreek/</a> for the dissemination of information.					
	Start Date	Month 1	Completion Date	Month 53		
Subtask 1.7	<p>GBRA will summarize the results and activities of this project through inclusion in GBRA's Clean Rivers Program Basin Highlights Report and/or Basin Summary Report.</p> <p>GBRA will provide updates on the results and activities of this project to the PCWP Steering Committee and in revisions to the Plum Creek WPP.</p> <p>GBRA will develop a final Assessment Data Report summarizing water quality data collected through Tasks 3-8. The Report shall, at a minimum, provide an assessment of water quality with respect to effectiveness of BMPs implemented and a discussion of interim short-term progress in achieving the Plum Creek WPP water quality goals.</p>					
	Start Date	Month 1	Completion Date	Month 53		
Deliverables	<ul style="list-style-type: none"> <li>• QPRs in electronic format</li> <li>• Reimbursement Forms and necessary documentation in hard copy format</li> <li>• Lists of action items needed from project coordination meetings</li> <li>• Promotional materials, as developed and disseminated</li> <li>• Project website</li> <li>• Final Assessment Data Report in both electronic and hard copy formats</li> </ul>					

Tasks, Objectives and Schedules						
Task 2	Quality Assurance					
Costs	Federal	\$8,400	Non-Federal	\$12,807	Total	\$21,207
Objective	To develop and implement data quality objectives (DQOs) and quality assurance/control (QA/QC) activities to ensure data of known and acceptable quality are generated through this project.					
Subtask 2.1	GBRA will develop a QAPP for activities in Tasks 3-10 consistent with <i>EPA Requirements for Quality Assurance Project Plans (QA/R-5)</i> and the <i>TSSWCB Environmental Data Quality Management Plan</i> .					
	Consistency with Title 30, Chapter 25 of the Texas Administrative Code, <i>Environmental Testing Laboratory Accreditation and Certification</i> , which describes Texas' approach to implementing the National Environmental Laboratory Accreditation Conference standards, shall be required.					
	All monitoring procedures and methods prescribed in the QAPP shall be consistent with the guidelines detailed in the <i>TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue (RG-415)</i> and <i>Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data (RG-416)</i> .					
Subtask 2.2	Start Date	Month 1		Completion Date	Month 2	
	GBRA will submit revisions and necessary amendments to the QAPP as needed.					
Subtask 2.3	Start Date	Month 3		Completion Date	Month 53	
	In anticipation of conducting Bacterial Source Tracking (BST) in the watershed as called for in the Plum Creek WPP, GBRA will work to obtain NELEC accreditation for EPA method 1603.					
Deliverables	Start Date	Month 3		Completion Date	Month 53	
	<ul style="list-style-type: none"> <li>QAPP approved by TSSWCB and EPA in both electronic and hard copy formats</li> <li>Approved revisions and amendments to QAPP, as needed</li> <li>Data of known and acceptable quality as reported through Tasks 3 – 12</li> </ul>					

Tasks, Objectives and Schedules						
Task 3	Routine Ambient Surface Water Quality Monitoring					
Costs	Federal	\$65,681	Non-Federal	\$52,200	Total	\$117,881
Objective	To provide water quality data to assess the effectiveness of implementing the Plum Creek WPP by enhancing current routine ambient monitoring regimes.					
Subtask 3.1	GBRA will conduct routine ambient monitoring at 5 sites monthly, collecting field, conventional, flow and bacteria parameter groups.					
	<p>Sampling period extends over 51 months. Total number of sample events scheduled for collection through this subtask is 255. Currently, routine ambient monitoring is conducted monthly at 3 stations by GBRA (17406, 12640 and 12647) through the Clean Rivers Program. Sampling through this subtask will complement existing routine ambient monitoring regimes such that routine water quality monitoring is conducted monthly at 8 sites in the Plum Creek watershed.</p> <p>GBRA's Regional Laboratory will conduct sample analysis.</p> <p>Field parameters are pH, temperature, conductivity, and dissolved oxygen. Conventional parameters are total suspended solids, turbidity, sulfate, chloride, nitrate nitrogen, ammonia nitrogen, total kjeldahl nitrogen, chlorophyll a, pheophytin, total hardness, and total phosphorus. Flow parameters are flow collected by gage, electric, mechanical or Doppler, including severity. Bacteria parameters are <i>E. coli</i>.</p>					
	Start Date	Month 3		Completion Date	Month 53	
Deliverables	<ul style="list-style-type: none"> <li>Water quality data from routine ambient monitoring as reported through Tasks 1, 11 and 12</li> </ul>					

Tasks, Objectives and Schedules						
Task 4	Targeted Watershed Surface Water Quality Monitoring					
Costs	Federal	\$182,776	Non-Federal	\$9,247	Total	\$192,023
Objective	To provide water quality data to access the effectiveness of implementing the Plum Creek WPP through targeted watershed monitoring.					
Subtask 4.1	GBRA will conduct targeted watershed monitoring at 35 sites twice per season, once under dry weather conditions and once under wet weather conditions, collecting field, conventional, flow and bacteria parameter groups. Of these 35 sites, 8 sites shall be the same as the sites for routine ambient monitoring described in Task 3 and 3 sites shall be the same as the sites for storm event monitoring described in Task 5, allowing for 24 sites for targeted watershed monitoring only.					
	<p>Sampling period extends through 17 seasons. Total number of sample events scheduled for collection through this subtask is 1060. Spatial, seasonal and meteorological variation will be captured in these snapshots of watershed water quality.</p> <p>GBRA's Regional Laboratory will conduct sample analysis.</p> <p>Field parameters are pH, temperature, conductivity and dissolved oxygen. Conventional parameters are total suspended solids, nitrate nitrogen, ammonia nitrogen, total kjeldahl nitrogen and total phosphorus. Flow parameters are flow collected by gage, electric, mechanical or Doppler, including severity. Bacteria parameters are <i>E. coli</i>.</p>					
	Start Date	Month 3		Completion Date	Month 53	
Deliverables	<ul style="list-style-type: none"> <li>Water quality data from targeted watershed monitoring as reported through Tasks 1, 11 and 12</li> </ul>					

Tasks, Objectives and Schedules						
Task 5	Storm Event Water Quality Monitoring					
Costs	Federal	\$37,359	Non-Federal	\$2,312	Total	\$39,671
Objective	To provide water quality data to assess the effectiveness of implementing the Plum Creek WPP through storm event monitoring.					
Subtask 5.1	<p>GBRA will conduct automated storm event monitoring at 3 urban/residential sites during 4 storm events annually collecting field, conventional, flow and bacteria parameter groups. The deployment sites will be located so that there is no duplication of monitoring with efforts funded through other projects or entities. Depending on meteorological conditions and availability of funds, additional sites may be identified for storm event monitoring.</p> <p>Sampling period extends over 21 months. Total number of storm events scheduled for collection through this subtask is 4 per year, or 8 over the course of the project, resulting in 24 sampling events. Depending on meteorological conditions, seasonal variation in storm events will be captured.</p> <p>GBRA's Regional Laboratory will conduct sample analysis.</p> <p>Field parameters are pH, temperature, conductivity and dissolved oxygen. Conventional parameters are total suspended solids, sulfate, chloride, nitrate nitrogen, ammonia nitrogen, total kjeldahl nitrogen and total phosphorus. Flow parameters are flow collected by gage, electric, mechanical or Doppler, including severity. Bacteria parameters are <i>E. coli</i>.</p>					
	Start Date	Month 29	Completion Date	Month 53		
Deliverables	<ul style="list-style-type: none"> <li>Water quality data from storm event monitoring as reported through Tasks 1, 11 and 12</li> </ul>					

Tasks, Objectives and Schedules						
Task 6	24-hour DO Surface Water Quality Monitoring					
Costs	Federal	\$23,644	Non-Federal	\$9,247	Total	\$32,891
Objective	To provide water quality data to assess the effectiveness of implementing the Plum Creek WPP through 24-hour DO monitoring.					
Subtask 6.1	<p>GBRA will conduct 24-hour DO monitoring at 7 sites monthly during the index period collecting field and flow parameter groups. These sites shall be the same as the sites for routine ambient monitoring described in Task 3 except for the site at CR202 because GBRA currently maintains a continuous water quality monitoring module that collects the flow and field parameters every hour. Sampling period extends over 8 months during the index period between March 15 and October 15. Samples will be collected during the index periods that fall in 51 months of the project. Total number of sample events scheduled for collection through this subtask is 238.</p> <p>Field parameters are pH, temperature, conductivity and dissolved oxygen. Flow parameters are flow collected by gage, electric, mechanical or Doppler, including severity.</p>					
	Start Date	Month 3	Completion Date	Month 53		
Deliverables	<ul style="list-style-type: none"> <li>Water quality data from 24-hour DO monitoring as reported through Tasks 1, 11 and 12</li> </ul>					

Tasks, Objectives and Schedules						
Task 7	Effluent Surface Water Quality Monitoring					
Costs	Federal	\$105,051	Non-Federal	\$19,983	Total	\$125,034
Objective	To provide water quality data to access the effectiveness of implementing the Plum Creek WPP through effluent monitoring.					
Subtask 7.1	GBRA will conduct effluent monitoring at 7 WWTFs once per month, collecting field, conventional, flow, bacteria and effluent parameter groups.					
	Sampling period extends through 51 months. Total number of sample events scheduled for collection through this subtask is 357.					
	GBRA's Regional Laboratory will conduct sample analysis.					
Subtask 7.2	Field parameters are pH, temperature, conductivity and dissolved oxygen. Conventional parameters are total suspended solids, sulfate, chloride, nitrate nitrogen, ammonia nitrogen, total kjeldahl nitrogen and total phosphorus. Flow parameters are flow collected by gage, electric, mechanical or Doppler, including severity. Bacteria parameters are <i>E. coli</i> . Effluent parameters are BOD, CBOD and COD.					
	Start Date	Month 3		Completion Date	Month 53	
	To supplement the data collected in Subtask 7.1, GBRA will compile all the weekly permit effluent monitoring data as submitted by permittees that includes BOD, total suspended solids, volatile suspended solids, <i>E. coli</i> , ammonia nitrogen and total phosphorus from seven WWTFs.					
Deliverables	Start Date	Month 3		Completion Date	Month 53	
	<ul style="list-style-type: none"> <li>Water quality data from effluent monitoring as reported through Tasks 1, 11 and 12</li> </ul>					

Tasks, Objectives and Schedules						
Task 8	Springflow Water Quality Monitoring					
Costs	Federal	\$13,099	Non-Federal	\$2,312	Total	\$15,411
Objective	To provide water quality data to access the effectiveness of implementing the Plum Creek WPP through springflow monitoring.					
Subtask 8.1	GBRA will conduct springflow monitoring at 3 springs once per season collecting field, conventional, flow and bacteria parameter groups.					
	Sampling period extends through 17 seasons. Total number of sample events scheduled for collection through this subtask is 51. Spatial and seasonal variation in springflow will be captured.					
	GBRA's Regional Laboratory will conduct sample analysis.					
Deliverables	Field parameters are pH, temperature, conductivity and dissolved oxygen. Conventional parameters are total suspended solids, sulfate, chloride, nitrate nitrogen, ammonia nitrogen, total kjeldahl nitrogen and total phosphorus. Flow parameters are flow collected by gage, electric, mechanical or Doppler, including severity. Bacteria parameters are <i>E. coli</i> .					
	Start Date	Month 3		Completion Date	Month 53	
	<ul style="list-style-type: none"> <li>Water quality data from springflow monitoring as reported through Tasks 1, 11 and 12</li> </ul>					

Tasks, Objectives and Schedules						
Task 9	Leona Aquifer Groundwater Water Quality Monitoring					
Costs	Federal	\$9,885	Non-Federal	\$2,135	Total	\$12,020
Objective	To provide water quality and metadata from shallow wells that are into the Leona formation within the Plum Creek watershed to determine if there is recharge of the Leona by the effluent-dominated Plum Creek.					
Subtask 9.1	GBRA will inventory up to 30 wells. Metadata, including water depth, installation method (hand-dug or mechanical), date of installation, cased, sealed or open, use of water, land use in immediate area of well, and proximity to Plum Creek or tributary will be collected. A map will be produced, using GPS coordinates that will display the location of each well.					
	Start Date	Month 13		Completion Date	Month 53	
Subtask 9.2	GBRA will collect water samples from the wells inventoried in Subtask 9.1. Total number of sample events to be collected through this Subtask should not exceed 30.					
	GBRA's Regional Laboratory will conduct sample analysis to include E. coli, nitrate nitrogen, ammonia nitrogen and total phosphorus. Results will be shared with the participating landowners.					
Subtask 9.2	Start Date	Month 13		Completion Date	Month 53	
	Deliverables	<ul style="list-style-type: none"> <li>Map of well locations; map will not reveal the identity of any landowner.</li> <li>Draft and Final Technical Report that describes findings on each well that includes metadata and water quality data</li> </ul>				

Tasks, Objectives and Schedules						
Task 10	Gain/Loss Study					
Costs	Federal	\$24,650	Non-Federal	\$2,135	Total	\$26,785
Objective	To better define the relationship between surface flows and groundwater recharge in the Plum Creek watershed.					
Subtask 10.1	USGS will conduct a gain/loss study on the Plum Creek watershed, based on five locations within the watershed. Stations included in the study will be Plum Creek at Plum Creek Road (17406), Plum Creek at CR 202 (12647), Plum Creek at CR 135 (12640), Clear Fork at Salt Flat Road (12556) and West Fork Plum Creek at Biggs Road (CR 131) (20500). The study will include two synoptic condition surveys.					
	Start Date	Month 3		Completion Date	Month 53	
Deliverables	<ul style="list-style-type: none"> <li>Draft and Final Technical Report on gain/loss study</li> </ul>					

Tasks, Objectives and Schedules						
Task 11	Water Quality Kiosks					
Costs	Federal	\$15,000	Non-Federal	\$20,313	Total	\$35,313
Objective	To provide access to the water quality monitoring data to the public, along with other pertinent information related to the WPP and water quality in general.					
Subtask 11.1	GBRA will design, construct and install three public information kiosks. Each kiosk will contain a computer that provides a link to the real time flow data collected at USGS gaging stations in the Plum Creek watershed; provides a link to real-time data being recorded at the GBRA Plum Creek at CR 202 continuous water quality monitoring station; and, provides a link to the Plum Creek Watershed Partnership and the GBRA project webpages. The kiosks will also have general water quality information and training for homeowners, such as the GBRA <i>River of Life</i> , and “ <i>Don’t be Clueless about the Plum Creek Watershed</i> ”, and the training modules produced by the “Taking Charge Of Water Quality in the Plum Creek Watershed” (developed through TCEQ CWA §106 funds), project including the Wastewater Treatment Module and the On-site Waste Treatment module.					
	The kiosks will be installed in three locations in the watershed. One location will be in the Kyle area; one kiosk will be located in the Lockhart area; and one kiosk will be located in Luling. In order to have access to electricity and internet services, public libraries will be the preferred location for the kiosks.					
	Start Date	Month 4		Completion Date	Month 53	
Subtask 11.2	GBRA will advertise the availability and locations of the kiosks through news releases, internet postings, newsletter announcements, public/conference presentations, flyers, etc., to enhance awareness. All announcements, letters, and publications will be reviewed and approved by the TSSWCB prior to dissemination.					
	Start Date	Month 4		Completion Date	Month 53	
Deliverables	<ul style="list-style-type: none"> <li>• Installation of three public information kiosks in the watershed</li> <li>• Press releases, newspaper articles, newsletters and public information statements</li> </ul>					

Tasks, Objectives and Schedules						
Task 12	Data Management					
Costs	Federal	\$0	Non-Federal	\$51,228	Total	\$51,228
Objective	To manage and transfer monitoring data for use in evaluating the success of implementing the Plum Creek WPP and for inclusion into the TCEQ SWQMIS					
Subtask 12.1	GBRA will submit Station Location Requests as needed to obtain TCEQ station numbers for new monitoring sites from activities in Tasks 3-8.					
	Start Date	Month 1	Completion Date	Month 53		
Subtask 12.2	<p>GBRA will transfer monitoring data from activities in Tasks 3-8 to TCEQ for inclusion in the TCEQ SWQMIS. Data will be transferred in the correct format using the TCEQ file structure, along with a completed Data Summary, as described in the most recent version of TCEQ <i>Surface Water Quality Monitoring Data Management Reference Guide</i>.</p> <p>Data Correction Request Forms will be submitted to TCEQ SWQMIS whenever errors are discovered in data already reported.</p> <p>All monitoring data files, Data Summary, and Data Correction Request Forms will also be provided to AgriLife Extension.</p> <p>GBRA will also transfer the data from activities in Tasks 9 and 10 to TSSWCB in the appropriate format for those monitoring activities.</p>					
	Start Date	Month 1	Completion Date	Month 53		
Subtask 12.3	GBRA will post monitoring data from activities in Tasks 3-8 and effluent monitoring data from Subtask 7.2 to the GBRA website in a timely manner.					
	Start Date	Month 1	Completion Date	Month 53		
Deliverables	<ul style="list-style-type: none"> <li>• Station Location Request Forms (as needed) in electronic format</li> <li>• Monitoring data files and Data Summary in electronic format</li> <li>• Data Correction Request Forms (as needed) in electronic format</li> <li>• Monitoring data updates posted to the GBRA website</li> </ul>					

### **Project Goals (Expand from Summary Page)**

- Generate data of known and acceptable quality for surface and ground water quality monitoring (routine ambient, targeted watershed, storm event, 24-hour DO, effluent and springflow) of main stem and tributary stations for field, conventional, flow, bacteria and effluent parameters; and, groundwater monitoring of shallow wells from the Leona Aquifer located along the Plum Creek for conventional and bacteria parameters
- Support the implementation of the Plum Creek WPP by collecting water quality data for use in evaluating the effectiveness of BMPs, and in assessing water quality improvement and progress in achieving restoration
- Communicate water quality conditions to the public through water quality kiosks and to the PCWP Steering Committee on project results and activities in order to support adaptive management of the Plum Creek WPP and to expand public knowledge on Plum Creek water quality data
- Conduct a gain/loss study to better define the relationship between surface flows and groundwater recharge in the Plum Creek watershed through two synoptic condition surveys

### **Measures of Success (Expand from Summary Page)**

- Data of known and acceptable quality are generated for surface water quality monitoring (routine ambient, targeted watershed, storm event, 24-hour DO, effluent and springflow) of main stem and tributary stations on Segment 1810 (Plum Creek) for field, conventional, flow, bacteria and effluent parameters;
- Data of known and acceptable quality are generated for groundwater monitoring of shallow wells from the Leona Aquifer located along the Plum Creek for conventional and bacteria parameters
- Water quality data is used to evaluate progress in implementing the Plum Creek WPP and achieving water quality restoration
- Water quality data is communicated to the public and the PCWP Steering Committee in a timely fashion
- Increased watershed stewardship among Plum Creek watershed stakeholders

**2005 Texas Nonpoint Source Management Program Reference (Expand from Summary Page)**

Goals and/or Milestone(s)

Element One – Explicit short- and long-term goals, objectives and strategies that protect surface and groundwater.

Long-Term Goal – To... restore water quality from NPS pollution through assessment, implementation, and education.

- Objective A – Focus NPS abatement efforts, implementation strategies, and available resources in watersheds identified as impacted by nonpoint source pollution.
- Objective C – Support the implementation of... programs to reduce NPS pollution, such as the implementation of strategies defined in... WPPs.
- Objective F – Increase overall public awareness of NPS issues and prevention activities.

Short-Term Goal One – Data Collection and Assessment – Objective B – Ensure that monitoring procedures meet quality assurance requirements and are in compliance with EPA-approved TCEQ and/or TSSWCB Quality Management Plans.

Short-Term Goal One – Data Collection and Assessment – Objective C – Conduct special studies to determine sources of NPS pollution and gain information to target...BMP implementation.

Short-Term Goal One – Data Collection and Assessment – Objective E – Conduct monitoring to determine effectiveness of... WPPs, and BMP implementation...

Short-Term Goal Two – Implementation – Objective D – Implement... WPPs developed to restore and maintain water quality in water bodies identified as impacted by NPS pollution.

Short-Term Goal Three – Education – Objective D – Conduct outreach through the Clean Rivers Program... to facilitate broader participation and partnerships [to] enable stakeholders and the public to participate in decision-making and provide a more complete understanding of water quality issues and how they relate to each citizen.

Element Two – Working partnerships and linkages to appropriate state, ... regional, and local entities, private sector groups, and federal agencies.

Element Five – The state program identifies ... watersheds impaired by NPS ... Further, the state establishes a process to progressively address these identified waters by conducting more detailed watershed assessments and developing watershed implementation plans, and then by implementing the plans.

**Part III – Financial Information**

<b>Budget Summary</b>				
Federal	\$	485,545	% of total project	65%
Non-Federal	\$	257,165	% of total project (≥ 40%)	35%
Total	\$	742,710	Total	100%
Category		Federal	Non-Federal	Total
Personnel	\$	30,190	\$ 109,823	\$ 140,013
Fringe Benefits	\$	12,227	\$ 44,478	\$ 56,705
Travel	\$	4,485	\$ 2,673	\$ 7,158
Equipment	\$	56,611	\$ 0	\$ 56,611
Supplies	\$	\$12,536	\$ 0	\$ 12,536
Contractual	\$	24,650	\$ 0	\$ 24,650
Construction	\$	0	\$ 0	\$ 0
Other	\$	335,973	\$ 67,914	\$ 403,887
Total Direct Costs	\$	476,672	\$ 224,888	\$ 701,560
Indirect Costs (≤ 15%)	\$	8,873	\$ 32,277	\$ 41,150
Total Project Costs	\$	485,545	\$ 257,165	\$ 742,710

The TSSWCB CWA §319(h) NPS Grant Program has a 60/40% match requirement. The cooperating entity will be reimbursed 60% from federal funds and must contribute a minimum of 40% of the total costs to conduct the project. The 40% match must be from non-federal sources and should be described in the budget justification. Reimbursable indirect costs are limited to no more than 15% of total federal direct costs. The project budget generally covers a three year period.

<b>Budget Justification (Federal)</b>		
Category	Total Amount	Justification
Personnel	\$ 30,190	Salary for GBRA Technicians
Fringe Benefits	\$ 12,227	40.5% of personnel category
Travel	\$ 4,485	Travel to sites for monitoring events
Equipment	\$ 56,611	Purchase of two storm water monitoring stations; two field sondes for collection of diurnal and field data; design and construction of three kiosks; laboratory equipment needed to attain accreditation for EPA method 1603
Supplies	\$ 12,536	Supplies needed to attain accreditation for EPA method 1603, collection of water quality monitoring samples and servicing monitoring sondes for collection of field data
Contractual	\$ 24,650	Gain/Loss study (\$24,650)
Construction	\$ 0	N/A
Other	\$ 335,973	Analysis of water quality samples
Indirect	\$ 8,873	29.39% of personnel category

<b>Budget Justification (Non-Federal)</b>		
Category	Total Amount	Justification
Personnel	\$ 109,823	Salaries for GBRA Water Quality Services Director; CRP Technician; GBRA Public Education Coordinator; Administrative Assistant and other GBRA staff
Fringe Benefits	\$ 44,478	40.5% of personnel category
Travel	\$ 2,673	Mileage for PCWP participation; continuous monitoring site; CRP water quality sample collection
Equipment	\$ 0	N/A
Supplies	\$ 0	N/A
Contractual	\$ 0	N/A
Construction	\$ 0	N/A
Other	\$ 67,914	Analysis of CRP water quality samples; operation and maintenance of continuous monitoring station; cost of housing kiosks in public library, including electricity and internet; volunteer sample analyses performed by city WWTF over and above current permit requirements.
Indirect	\$ 32,277	GBRA – 29.39% of personnel category only